National Institute of Environmental Health Sciences

Serum concentrations of an aflatoxin-albumin adduct in the National Health and Nutrition Examination Survey (NHANES) 1999-2000

Author(s): Schleicher RL, McCoy LF, Powers CD, Sternberg MR, Pfeiffer CM
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Abstract:

Background: During 1998, weather conditions in the United States favored the growth of Aspergillus species leading to widespread contamination of Midwestern and Southern corn with hepatotoxic and hepatocarcinogenic aflatoxins. We designed a study to provide the first national prevalence estimate of aflatoxin exposure using the National Health and Nutrition Examination Survey (NHANES), a representative cross-sectional survey of the noninstitutionalized civilian population of the US. Methods: Isotope dilution liquid chromatography-tandem mass spectrometry was used to quantitate serum concentrations of aflatoxin B1-lysine in a one-third random subset of participants from NHANES 1999-2000. Results: About 1% of the U.S. population had detectable levels (≥ 0.02 μg/l) of aflatoxin B1-lysine. Of those with detectable levels, the geometric mean (95% confidence interval) was 0.038 (0.024-0.060) μg/l (equivalent to 0.842 (0.530-1.34) pg/mg albumin). The highest value was 0.2 μg/l (4.43. pg/mg albumin). Based on liver function biomarkers, there was no evidence of increased liver dysfunction in these persons. Conclusions: During a time when exposure to aflatoxins in food products might have been expected to be increased, we identified few exposed persons. Although none of the subgroup analyses provided reliable estimates due to high relative standard errors, they suggested that additional targeted surveillance may be warranted. •1% had aflatoxin B1exposure.•No evidence for liver dysfunction.•Additional targeted surveillance may be warranted.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Quality

Food/Water Quality: Biotoxin/Algal Bloom

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

United States

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Cancer, Infectious Disease, Other Health Impact

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease (other): hepatotoxicity

Other Health Impact: aflatoxins

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Low Socioeconomic Status, Racial/Ethnic Subgroup

Other Racial/Ethnic Subgroup: Mexican American

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified